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FORMERLY WILLOW RUN LABORATORIES, THE UNIVERSITY OF MICHIGAN

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## ERTS PROGRAM SUMMARY

Under Contract NAS5-21783

<u>TASK</u>	<u>PRINCIPAL INVESTIGATOR</u>	<u>MMC #</u>	<u>UN #</u>	<u>SHORT TITLE</u>
I	Polcyn	063	200	Water Depth Measurement
II	Thomson	077	621	Yellowstone Park Data
III	Thomson	137	636	Atmospheric Effects (Colorado)
IV	Bryan	072	201	Lake Ice Surveillance
V	Sattinger	086	225	Recreational Land Use
VI	Polcyn	114	635	IFYGL (Lake Ontario)
VII	Malila Nalepka	136	612 178	Image Enhancement
VIII	Wezernak	081	625	Water Quality Monitoring
IX	Horvath	079	606	Oil Pollution Detection
X	Vincent	075	422	Mapping Iron Compounds

(E74-10588) [WETLANDS MAPPING OF  
MICHIGAN FROM ERTS DATA] Bimonthly  
Report, 1 Mar. - 30 Apr. 1974

N74-27778

(Environmental Research Inst. of Michigan)

Unclas

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CSCL 08B G3/13 00588

In order to determine the operational potential of ERTS data for wetlands mapping using this approach, these phenological changes are being studied in detail. Color IR photography of the study area (the E. S. George Reserve) was obtained in early April both from the ground and from a low-altitude aircraft flight to provide information needed for study of these phenological changes. The ground-based and aerial photography along with ERTS imagery for various dates are now being used to study changes in surface water distribution and phenological changes in wetland and upland vegetation which would best permit discriminating among various types of wetlands at different dates. This work will lead to selecting the best combination of dates for identification and mapping of both wetland and upland vegetation.

#### Operational Use of ERTS Data

The tentative results of the work on this project directed toward the application of wetland mapping are already being used in making recommendations to the State of Michigan concerning the use of ERTS data to meet its legal obligations for preparing a statewide inventory of wetlands. In a recent letter to ERIM, A. Gene Gazlay, Director of the Michigan Department of Natural Resources, describes the urgent need for rapid and economical methods of collecting wetlands inventory information. Such inventories should be prepared at intervals of 5-10 years to provide up-to-date information on the quantity, quality and distribution of wetlands. This information is needed by policy makers for adopting and enforcing state policy for the protection and management of wetlands through such measures as public acquisition of wetland areas and zoning restrictions. Such information is also needed by wildlife management personnel for managing wetlands based on a knowledge of the relationships of number and quality of wetlands to the waterfowl and other wildlife they can support.

A method of accomplishing this inventory through the combined use of ERTS data and low-altitude aerial photography has been proposed and discussions are being held with technical and supervisory personnel of the Michigan Department of Natural Resources concerning the possibility of undertaking such a survey with state support. This prospect would constitute an early use of ERTS data in a completely operational context.

The proposed operational system of wetland inventory would be a multi-stage sampling method: ERTS-1 data for one or more dates would be computer-processed to produce the first level of wetland enumeration; aerial photography would provide the higher resolution recognition and mapping needed to adjust the sample estimate of wetland regions detected by ERTS-1.

#### Program for Next Reporting Interval

During the next reporting interval, the analysis of seasonal and phenological changes will be completed to define the best dates of ERTS coverage needed for wetlands mapping, as well as to distinguish various types of upland vegetation. The results of this analysis will be used in the preparation of a map of wetland and natural vegetation areas in Oakland County.

## SUMMARY REPORT

Ninth Type I  
Contract NAS5-21783  
Period - 1 March - 30 April 1974

TASK I - Water Depth Measurement - 1388  
F. C. Polcyn, UN 200, MMC 063

Final report is nearing completion. Advance copy to be submitted to sponsor, should be mailed within 30 days.

TASK II - Yellowstone National Park Data - 1398  
F. J. Thomson, UN 621, MMC 077

Final report is nearing completion. Advance copy to be submitted to sponsor, should be mailed within 30 days.

TASK III - Atmospheric Effects in ERTS-1 Data - 1410  
F. J. Thomson, UN 636, MMC 137

Final report is due 1 November 1974. There is still a small amount of work to be completed before report preparation is begun.

TASK IV - Lake Ice Surveillance - 1406  
M. Leonard Bryan, UN 201, MMC 072

Final report is due 9 September 1974. Analysis of last data collection is under way. When this analysis is completed final report preparation will begin.

TASK V - Recreational Land Use - 1387  
I. J. Sattinger, UN 225, MMC 086

Analysis of Multidate Mapping Techniques

Analysis of the utility of ERTS data for mapping of wetland and upland areas is continuing. Work reported in the Type II Progress Report for 1 July through 31 December 1973 indicates that a number of important types of wetlands in Michigan can be distinguished by spectral analysis of ERTS data collected at various seasons. The analysis was based on data collected in early spring and early summer.

TASK VI - IFYGL (Lake Ontario) - 1384  
F. C. Polcyn, UN 635, MMC 114

Final report for this project is due 31 August 1974. All processing has been completed for the mapping of the Lake Ontario watershed by means of ERTS-1 data. Work on the final report has begun.

TASK VII - Image Enhancement and Advanced Information Extraction  
Techniques - 1385  
W. A. Malila, UN 612, R. F. Nalepka, UN 178, MMC 136

Final report for this task is due 8 October 1974. All processing has been completed. Work on the final report will begin soon.

TASK VIII - Water Quality Monitoring - 1400  
C. T. Wezernak, UN 625, MMC 081

Technical work of this task is essentially completed. Work on the final report preparation will begin soon.

TASK IX - Oil Pollution Detection - 1389  
R. Horvath, UN 606, MMC 079

During this reporting period the ERTS material (frame 1525-18151) mentioned in the previous bimonthly progress report, was received. This material consists of the imagery for all bands, in black and white transparencies, and the magnetic tapes.

Preliminary analysis was begun during this period, and analysis of the tapes is scheduled during the next bimonthly period.

ERIM is again receiving all EPA Oil Spill Summary Reports for perusal and comparison with ERTS overflights.

TASK X - ERTS Experiment for Mapping Iron Compounds - 1383  
R. K. Vincent, UN 422, MMC 075

Final report is due 30 September 1974. The report is in process.